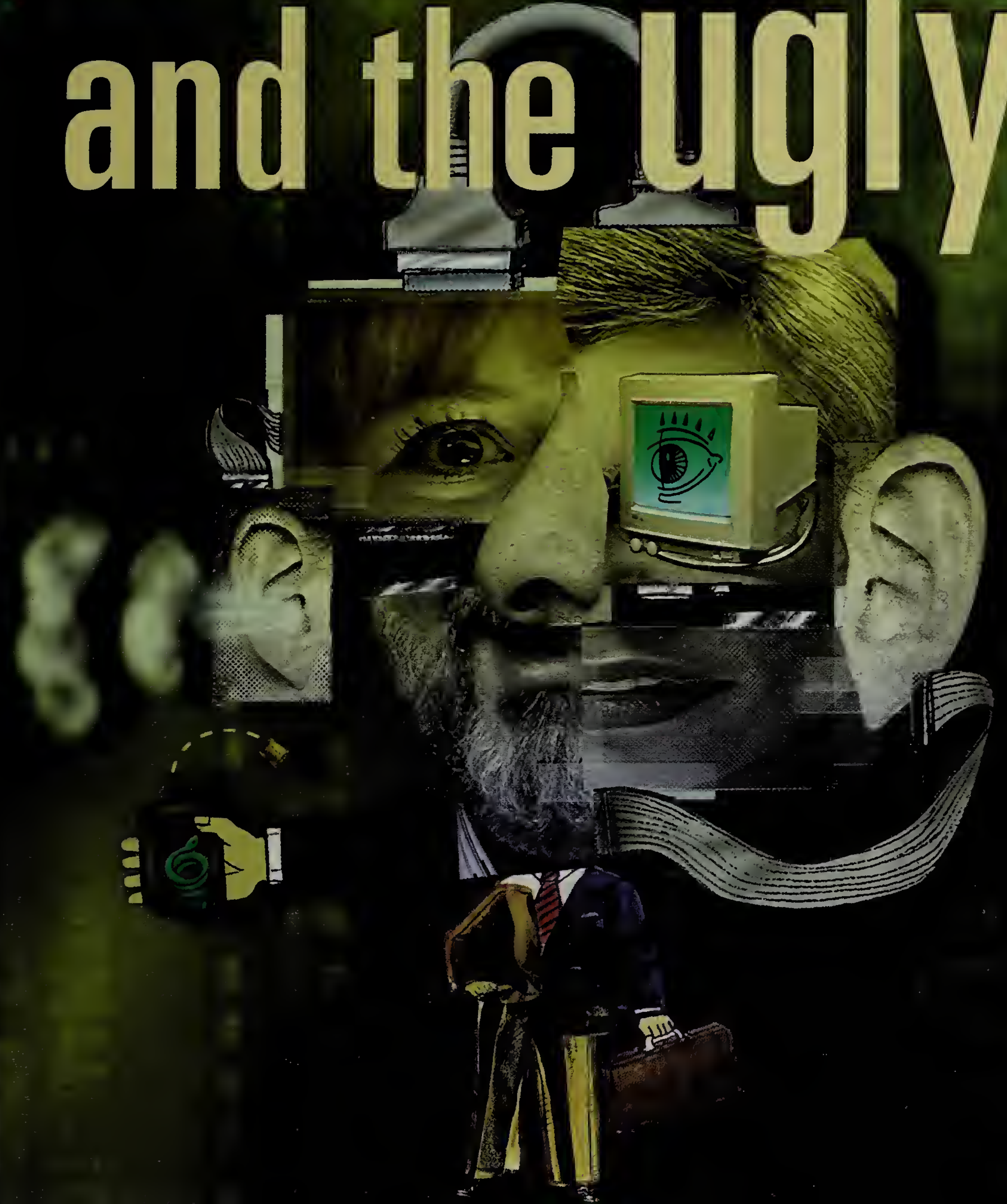
COMPUTERWORLD

FEBRUARY 26, 1996

Rating 25 of the Largest Systems Integrators

The good the bad and the ugly



An exclusive Computerworld survey report

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GETTING TO KNOW YOUR INTEGRATOR

There are any number of metaphors to describe a company's relationship with a systems integrator. Marriage seems to crop up a lot. Sharing intimacies, working shoulder-to-shoulder and maintaining open communication are all attributes of a sound partnership. When the relationship is going well, life can be very good. But when it breaks down, things can turn ugly.

Computerworld's rating of 25 of the largest systems integrators is intended to help you avoid ugly situations. With our partner, ParaTechnology, Inc., a Bellevue, Wash.-based market research and consulting company, *Computerworld* surveyed more than 1,000 information systems managers to gauge their level of satisfaction with their integrators. (See pages SI/17 and SI/18 for complete details of the findings and a description of the survey methodology.)

The Top 10

1. **AmeriData Technologies, Inc.**
2. **Unisys Corp.**
3. **Hewlett-Packard Co.**
4. **Control Data Systems, Inc.**
5. **USConnect, Inc.**
6. **Price Waterhouse**
7. **Digital Equipment Corp.**
8. **Deloitte & Touche**
9. **The Future Now, Inc.**
10. **MicroAge, Inc.**

Exclusive *Computerworld* Customer Satisfaction Survey

In addition to providing detailed customer satisfaction scores for these leading integrators, this report offers advice and case studies that will help you keep the relationship amicable.

The survey found that some companies, such as AmeriData Technologies, Inc., Unisys Corp. and Hewlett-Packard Co., consistently outperform their rivals in all 22 areas we measured. Others, such as Electronic Data Systems Corp., SHL Systemhouse, Inc. (recently acquired by MCI Communications Corp.), and Computer Sciences Corp. (CSC), don't do quite as well. This report examines why.

Of course, comparing AmeriData with CSC is not entirely apples-to-apples. Indeed, every integrator is different in some respects. For instance, AmeriData, with its origins as a value-added reseller, uses a "bottom-up" approach in its integration business; CSC uses a "top-down" approach. Top-down companies typically focus on consulting and application development, while bottom-up firms focus on technology implementation. (See "Top-Down vs. Bottom-Up" on page SI/10.)

Another difference is in the size of contracts. More than two-thirds of AmeriData's business comes from contracts of under $1 million, according to the survey. CSC, on the other hand, derives two-thirds of its business from contracts over $1 million, with 23% of its contracts in excess of $10 million. The bigger the project, the more complicated the relationship and the greater the potential for problems. (See "Big Britches" on page SI/7.)

The type or size of the contract notwithstanding, companies use a common set of criteria to evaluate an integrator's performance. More than anything, they expect technical competency, on-time delivery and a reasonable price. When these things are not forthcoming, relations can turn contentious.

The survey found that, to their own detriment, customers typically gloss over some criteria that are vital to the success of a project. For example, few consider conflict resolution and personal relations when selecting an integrator. Yet talk to experienced project managers, and they will insist that a formal conflict resolution mechanism is essential. Without it, communication breaks down, and lawsuits can result. (See "Avoiding the D Word" on page SI/11.)

The bottom line is hardly rocket science: Responsibility for a successful relationship lies with both customer and integrator. Like a marriage, it takes work and constant communication. My hope is that this report will provide a comprehensive picture of the systems integrator relationship. Keep it handy. •

— Bruce Rayner, Editor
Special Projects
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THE MOST IMPORTANT CRITERIA USED TO EVALUATE AN INTEGRATOR ...

1. Integrator's technical expertise **Top ranked:** IBM, HP, Unisys	16%
2. Project's actual completion time vs. scheduled **Top ranked:** AmeriData, Price Waterhouse, Unisys	10%
3. Project's final price relative to performance **Top ranked:** USConnect, Unisys, AmeriData	7%

...AND THE LEAST IMPORTANT (BUT POTENTIALLY SHOW-STOPPING)

1. Integrator's problem resolution process **Top ranked:** AMS, AmeriData, Control Data	2%
2. Project's compatibility with other systems **Top ranked:** USConnect, AmeriData, Entex	2%
3. Personal relationship with systems integrator **Top ranked:** Unisys, AmeriData, Control Data,	1%
4. Training provided by systems integrator to company **Top ranked:** Deloitte & Touche, AmeriData, Price Waterhouse	1%

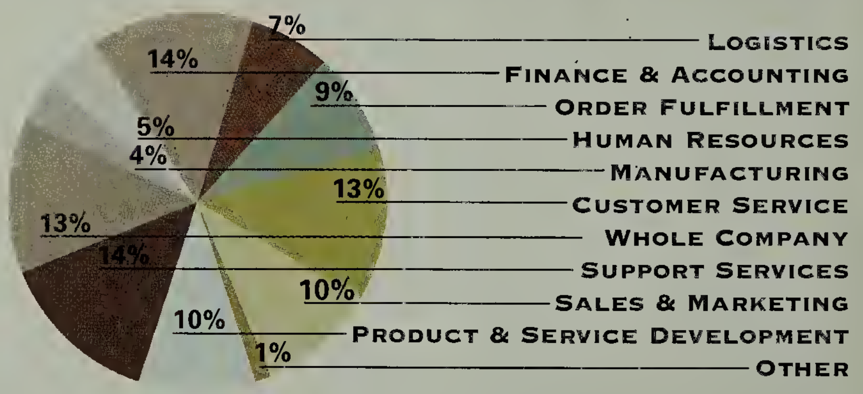
Based on the *Computerworld* survey question: What are the Top 3 aspects of the systems integration project in terms of importance to you as a customer? (Percent of total respondents.)

THE TOP THREE REASONS FOR USING AN EXTERNAL VENDOR FOR A SYSTEMS INTEGRATION PROJECT, AS OPPOSED TO INTERNAL RESOURCES

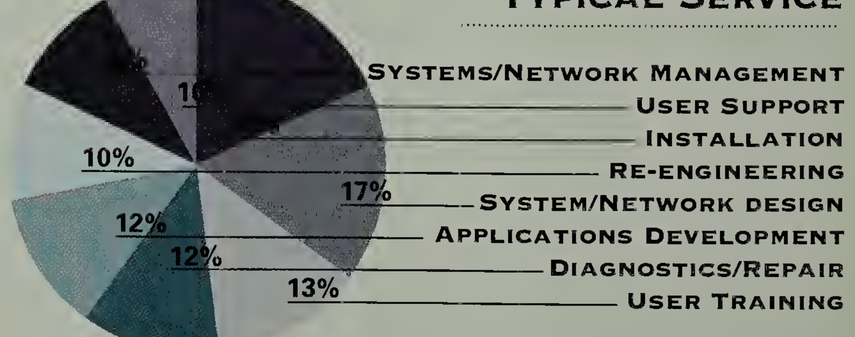
1. Lack of internal expertise	25%
2. Lack of internal manpower	24%
3. Reduce implementation time	19%

INTEGRATION PROJECTS AT COMPANIES SURVEYED

FUNCTIONAL AREA



TYPICAL SERVICE



Source: *Computerworld* and ParaTechnology, Inc.

Who to choose?

By Alan R. Earls

FINDING A SYSTEMS INTEGRATOR THAT MEETS YOUR EXPECTATIONS DEPENDS ON HOW WELL YOU KNOW THE DANCE STEPS.

A few years ago, Intergen Co. picked AT&T Corp. as its systems integrator, a decision that turned out to be anything but the right choice. "We worked with them for a little while," says Mark Sternefeld, Intergen's MIS supervisor. "When I asked a question, they would say they would get back to me, but they never did."

Indeed, service proved to be such a serious issue that the Purchase, N.Y.-based biopharmaceuticals company embarked on a series of relationships with other firms. Like many companies, Intergen discovered the hard way that picking a systems integrator is like picking a dance partner — it pays to choose carefully if you want to avoid missteps.

In Intergen's case, experience has brought the company full circle. "We are looking again at AT&T because they do have good technology," Sternefeld admits. Intergen also looked at Sprint Corp. and MCI Communications Corp.

Because so much is at stake in the relationship, it pays to define clearly what you want at the very beginning. A highly structured selection process, with good documentation and contracts, is the only guarantee of long-term success, insists Ioannis Kyratzoglou, a technical staff member at Mitre Corp. in Bedford, Mass.

As a government-funded research and development firm, Mitre has been both a customer of systems integrators (Unisys Corp., for example) and a middleman in arranging such services, Kyratzoglou says. That dual role, he says, has given him a lot of experience in choreographing the relationship between systems integrators and their customers.

Kyratzoglou recommends that companies detail their requirements and goals, have a clear idea of budget limits and, particularly important, possess a well-defined plan for sorting through vendors. "Then you should assemble a group of people, including lawyers, contract people and technical people, to review the candidates," he says.

There are literally hundreds of questions to ask systems integrators. Many are common sense: What is the company's financial and technical viability? How well does it follow processes? Is it usually on schedule? What is its technical approach?

BUYING EXPERIENCE

Even when a candidate survives every inquiry you can devise, it is still prudent to document expectations in detailed technical specifications. "We always try to do an in-depth project definition, and then we work with [the systems integrator] to fine-tune our needs," says Paul Maggio, MIS manager at Air Products & Chemicals, Inc. in Calvert City, Ky.

Maggio also looks at the integrator's experience. Currently, Electronic Data Systems Corp. is creating a maintenance and materials management system for Air Products that does everything from inventory control to billing and payroll. Part of the reason EDS got the business: "[It] had done this kind of project before with systems similar to ours," Maggio says.

Proximity is another consideration. Pete Battisti, a vice president of finance at Burleigh Instruments, Inc. in Fishers, N.Y., says a systems integration contract with Digital Equipment Corp. — replacing an outdated VAX-based manufacturing system with a LAN connecting 60 people — has worked well in large part because Digital's local office is only two miles away. "If they can't deal with something on the phone, they are here immediately," he says.

Similarly, Allen Tarbox Jr., director of MIS at the Bank of New Hampshire in Manchester, tossed out a highly regarded national firm when he needed to tie together a new Novell network, electronic-mail software and a number of banking-specific packages. He hired a small, local integrator that could provide the extra attention he demanded.

When the right ingredients are in place, a systems integrator can be a godsend. Tracy Freeman, manager of systems development at Cedar Rapids, Iowa-based Norand Corp., a maker of portable computers, credits Deloitte & Touche with "helping us pinpoint savings and see what the main business functions were that could benefit from new systems."

Says Tarbox: "When you rely on someone, you have to have a lot of confidence in them — confidence they have the right people." •

TIPS FOR SELECTING AN INTEGRATOR

✓**Communicate.** This can keep interpersonal or technical problems from becoming irreconcilable differences.

✓**Define the project.** Take time to plan and review your project's scope.

✓**Flexibility.** Leave room for flexibility if needs change or problems arise.

✓**Subcontracting.** Find out if the integrator will do the work or farm it out.

✓**Plan for change.** Evaluate and define a project's impact on the organization.

✓**Pay for what you get.** Don't pay for a project based on time and materials. Pay for systems that work.

✓**Size.** Make sure the integrator is big enough for your project and has offices convenient to you.

✓**Reputation.** Place a premium on firms with strong reputations. Ask other IS organizations who they recommend.

✓**Leadership.** Find an integrator that can provide a strong project manager.

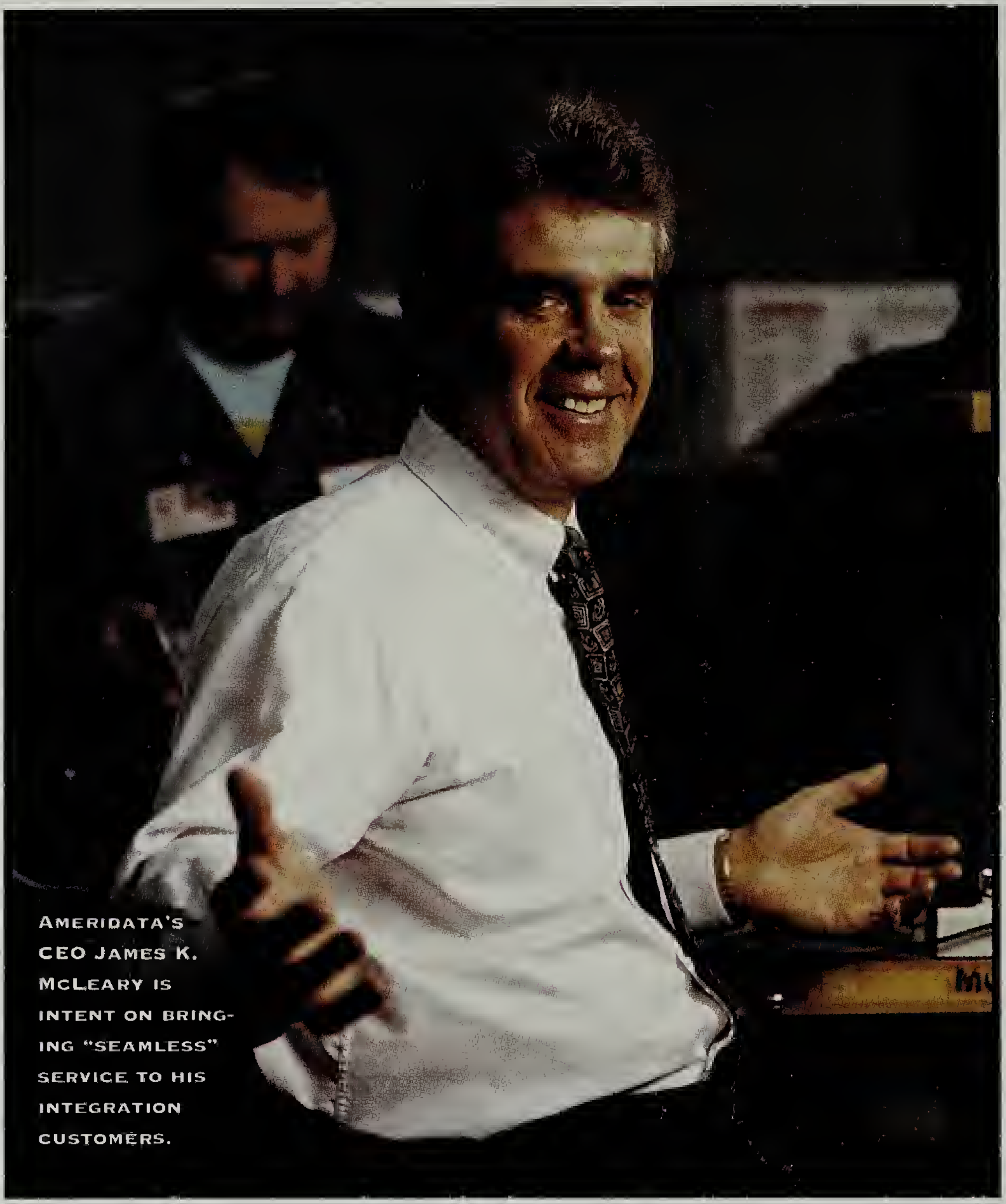
✓**Experience.** Look for integrators with hardware and software know-how.

Earls is a freelance writer in Franklin, Mass.

Illustration by Greg Clarke

AmeriData Technologies, Inc.

GROWTH THROUGH ACQUISITION AND A SMART BUSINESS MODEL BOOST THIS VALUE-ADDED DISTRIBUTOR *CUM* INTEGRATOR INTO THE TOP SPOT.



AMERIDATA'S CEO JAMES K. MCLEARY IS INTENT ON BRINGING "SEAMLESS" SERVICE TO HIS INTEGRATION CUSTOMERS.

1994 TOTAL REVENUE: $1,018,545,000
1994 INTEGRATION REVENUE* (SERVICES ONLY): $69,500,000
INTEGRATION EMPLOYEES: 882
LARGE COMMERCIAL CONTRACTS: SAMSONITE CORP.(DENVER), NALCO CHEMICAL CO. (NAPERVILLE, ILL.)
TOPS THE CHARTS: FLEXIBILITY, EASE OF USE, OVERALL QUALITY, COMPLETION TIME, FINAL PRICE VS. BID, EASE OF DOING BUSINESS
CHARACTERISTICS: BOTTOM-UP INTEGRATOR, 10,000 INTEGRATION CLIENTS
*NORTH AMERICAN

1

To say AmeriData is growing is like saying the Internet has generated a *little* interest lately. From 1992 revenue of just over $64 million, the company topped $1 billion in 1994 — that's a 300% growth rate a year. Revenue projections for 1995 hover around $1.5 billion.

Much of that growth is due to the company absorbing some 30 independent companies, including consultants, value-added resellers and distributors. Founded in 1968, the company has offices in 130 cities around the world. In the U.S., 70 offices house AmeriData's six distribution centers, 600 salespeople and a total of 2,300 employees, including almost 1,000 consultants, engineers and technicians. Last year, the company acquired part of Control Data Systems, Inc.'s international business for $34 million, opening new integration opportunities overseas.

"The company is built on a regional business model," says Lee Stagni, AmeriData's vice president of marketing. "Within the regions, we offer configuration integration for our customers as well as higher level consulting — both are driven from the field."

AmeriData's business model has a decidedly protective bent. While most organizations welcome the flexibility and freedom made possible by the PC, they also pine for the old days when a single big vendor — IBM, for example — handled all the details, says CEO James K. McLeary. "It's that seamless experience that we are trying to bring back for our customers," he says, "while also giving them the freedom of an a lá carte menu."

VENDOR OF CHOICE

AmeriData's philosophy and capabilities made a convert of Deborah Hirsch, staff assistant for technology at First National Bank of Maryland in Baltimore. "They have become our vendor of choice for all hardware procurement," she says. "They also provided an integration process for our servers and workstations across 180 locations."

Hirsch uses words like "flexible," "thorough" and "sensitive" to describe AmeriData's performance. "I don't have to give them detailed instructions, because they know what we will want when we decide to upgrade a site." When AmeriData did First National Bank's file-server rollout, for example, "it was accomplished without any First National people, and they achieved a 96% accuracy rate."

Of course, the approbation is not universal. A CIO at a regional hospital in the Mid-Atlantic States says that his satisfaction with integration work performed by an independent organization that was acquired by AmeriData in April 1995 has dropped. "The service has gone downhill," he says. "We used to get phone calls returned, but now we are a small account, and we are getting short shrift."

While defending its successes, AmeriData admits that melding tiny companies into a coherent whole — and continuing to grow rapidly — hasn't been easy.

But even though a few problems have arisen during the company's massive acquisition binge, many have been avoided, insists Steve Stringer, executive vice president of sales and service, and the man responsible for acquiring and integrating most of AmeriData's business units. "Rather than picking up companies in trouble," he says, "we always looked for successful companies with strong management that fit our business model."

"The key," Stringer adds, "is our regional business model. We don't want a billion dollar corporation dictating how you do business in a regional market. We encourage entrepreneurial flexibility."

THE OTHER SIDE

While many of AmeriData's clients know it first as a systems integrator providing business process re-engineering, database design, project management and training, there is another side to the company — what one analyst dubs its "single-tier distribution strategy."

AmeriData has developed a nationwide computer and peripheral distribution business, with regional distribution centers and $100 million in inventory at any time. "If you look at the value chain, we begin with product fulfillment where the value-added is low," Stagni says. "Then we build value-added on top of that. In growing our company, we have looked for acquisitions that fit that model."

The early acquisitions, Stagni notes, were mostly value-added resellers with turnkey specializations, often in networking. Next came integrators with individual businesses in the $100 million to $200 million range. The most recent wave of acquisitions, he says, involved "dealer-based systems integrators" and "some pure network and service firms."

The challenge now, Stagni says, is to provide "intellectual capital" to overseas operations to ensure they grow to their full potential as value-added service providers. •

—Alan R. Earls

Photo by Steve Woit

Unisys Corp.

2

Even though it sells hardware, Unisys focuses on delivering solutions.

While still a purveyor of hardware and systems, notably in transaction processing and scalable multiprocessors, Unisys Corp. is seeing most of its growth in services, including consulting, outsourcing, business process re-engineering, and systems integration. Indeed, in recent years, the company's systems integration business — both governmental and commercial — has grown at a rate of more than 40% annually, accounting for $1.3 billion, or 65% of information services revenue.

"Since we have been the largest supplier of systems integration services to the U.S. government for the past 25 years, we are used to working with other people's equipment," says Paul McGuire, principal, systems architecture, in the Unisys Information Services Group. (In the spring of 1995, Unisys sold its government defense operations to New York-based Loral Corp. And last month, Unisys reorganized into three separate business units: information services, computer systems and customer services.)

Systems integration services — from multivendor integration to solutions development, outsourcing, consulting, and training — are offered through the Unisys Information Services Group's Worldwide Information Services division. "People are sometimes concerned that we will try to sell them everything that has a Unisys label on it, but this independent structure ensures that won't happen," insists Bob Tumanic, managing principal, who is responsible for Unisys' systems integration practice worldwide.

Indeed, says Gregory S. Merth, IS manager at Tru-Part Manufacturing Corp., in St. Paul, Minn., and a Unisys integration customer. "They seem to be only interested in finding the solution that fits."

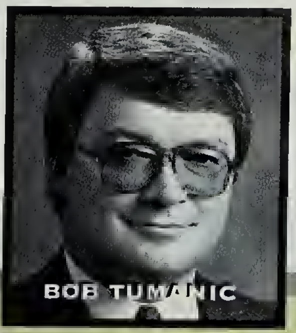
Merth says Unisys' hardware savvy showed through. "They put together a proposal and outlined a budget that they never deviated from. With other integrators, the price seemed to go up and up."

Frank Elvin, operations manager at Elvin Safety Supply, Eden Prairie, Minn., is another satisfied customer. In particular, he credits Unisys with helping him make the most of existing resources in designing and implementing a new LAN- and WAN-based architecture throughout several company locations.

However, while Elvin says he would consider using Unisys again, he tempers his praise with a few qualifiers. "Implementation," he says, "dragged on and on" and the company annoyed him when it simply refused to install equipment linking executives' home-based offices to the WAN. "Maybe I wasn't their biggest customer," he muses.

"Our heritage is doing business with the bigger transport and public sector organizations," Tumanic admits. However, he adds, "as a service provider, we are working hard to go beyond that." •

—Alan R. Earls



1994 total revenue: $5,978,200,000
1994 integration revenue* (services only): $302,400,000
Large commercial contracts: NASDAQ Stock Market (New York), Ford Motor Co.(Detroit), Nationwide Mutual Insurance (Columbus, Ohio)
Tops the charts: Personal relationships, innovativeness
Characteristics: 60,000 integration clients, 32% of integration business is North American
*North American

Hewlett-Packard Co.

3

Hardware and integration go hand in hand at HP.

Unlike some of its hardware brethren, Hewlett-Packard Co. freely admits close ties between its systems integration and hardware businesses.

"It would be pretty unlikely that we would go after a project where there was no HP product content," says Glenn Osaka, general manager of HP's professional services organization, which is based in Mountain View, Calif.

"We are biased to HP technology," Osaka admits, "but one of the advantages is that customers can see our bias. There are firms that say they are [product] independent, but in fact, they have biases."

HP's key vertical markets are manufacturing, telecommunications and financial services; it has a more limited presence in about a dozen other markets ranging from health care to education.

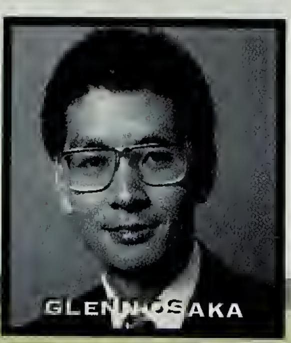
John Comish, manager of microwave products at the ITT Gallium Arsenide Technology Center in Roanoke, Va., confirms HP's skill in the manufacturing market. The wafer fabricator, which is already a heavy user of HP equipment, hired HP to create an integrated manufacturing system that will tie together islands of automation. The $3 million project is expected to take 2½ years; installation began in May 1995.

"A couple of times, HP said things we didn't want to believe, but later we had to admit they were right on the money," Comish says. In the networking and database arena, for example, HP recommended a master database, while ITT was working with several databases that did not talk to each other. "HP made it perfectly clear to us that we were creating work by having separate database and data collection systems — work that in some cases was invisible to management," he says.

A medical customer, St. Mary Hospital in Hoboken, N.J., also was pleased with the company's service. HP installed two HP 9000 Unix workstations a year ago and helped the hospital share medical, financial and administrative data with St. Francis Hospital in Jersey City, N.J., over a T1 line using X.25 packet switching.

"HP assisted us in the installation of their Unix operating system and the X.25 hookup and made communications go smoothly between the two hospitals," says John Servello, PC LAN coordinator at St. Mary. "We actually went live with no problems, and it was done on time." •

—Steve Alexander



1994 total revenue: $25,000,000,000
1994 integration revenue* (services only): $903,000,000
Integration employees worldwide: 5,000
Large commercial contracts: Weyerhaeuser Co. (Tacoma, Wash.), General Electric Co. (Fairfield, Conn.), FoxMeyer Health Corp. (Carrollton, Texas)
Tops the charts: Technical features, business benefits, service and support
Characteristics: Specializes in manufacturing and telecommunications contracts
*North American

Control Data Systems, Inc.

4

From mainframe maker to systems integrator, CDS gives an old name a new image.

A 3½-year-old start-up with a 39-year history. That's how Control Data Systems, Inc., describes itself.

A mainframe maker since 1957, the former Control Data Corp. was threatened with being left behind in the 1980s by the shift to desktop computing. In 1992, it split into two businesses: Ceridian Corp., an information services company, and Control Data Systems, Inc. (CDS), a systems integrator.

Plans for CDS's future revolve around the desire to be a leader in integration solutions for electronic commerce and product-data management. "If we focus on those areas, we can clearly be in the top two or three [integrators] in the country based on revenue," claims James Ousley, CDS's CEO.

In the product-data management market, for example, CDS developed Metaphase, a data management software product, which has enabled Swedish telecommunications manufacturer Ericsson SpA to run production around the clock and around the world. Ericsson controls all data and tools in product development by using Metaphase 2 and an "Ericsson layer." This added layer allows for communication with the system in terms familiar to Ericsson, says Jan Johansson, Ericsson's executive project leader.

At the start of the relationship between CDS and Ericsson in early 1995, "we initially were not very happy with the consultancy offerings from CDS, but the situation has improved considerably. At this stage, we are fairly satisfied with their performance," Johansson says.

Ericsson is looking to assign other subprojects to CDS.

Mervyns California is more than satisfied. The department store company hired CDS to remove old point-of-sale terminals and install new ones. The integrator also configured hubs, programmed terminals and integrated new scanners into the terminals.

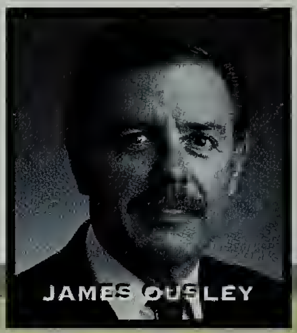
"We were very happy with Control Data," says Paul Weiler, Mervyns' manager of network support. "There were just a minimal number of things that went wrong, and the same thing never went wrong twice."

After completing the project for Mervyns, CDS asked Weiler what they could do to improve. "I was at a loss for words," he says. "I said I couldn't think of anything they could have done differently."

The past three years, however, have not been without some growing pains. In 1993, when CDS acquired Evernet Systems, Inc., Sun Diamond Growers of California suffered when the integrator installed a LAN. "They did things haphazardly, and we've been paying for it for over a year," says Lawrence DeBerry, director of internal audit at Sun Diamond Growers.

"We have really moved away from the LAN integration business and more into the solution business, so there probably were some issues with some of those customers," Ousley explains. •

—Amy Malloy


JAMES OUSLEY

1994 total revenue: $524,200,000
1994 integration revenue* (services only): $70,697,860
Integration employees: 2,100
Large commercial contracts : Norwest Mortgage (Minneapolis), Fleet Bank (Providence, R.I.), Dow Chemical (Midland, Mich.)
Tops the charts: Aggregated business practices
Characteristics: 60% of integration business is international
*North American

USConnect, Inc.

5

A family of independent integrators extends the reach of USConnect.

When Chicago-based Superior Graphite Co. needed to install local-area and wide-area networks, USConnect, Inc., was the obvious choice. Because 85% of its projects involved PC LANs, USConnect had the necessary experience.

It was one of those no-fuss, no-muss type of deals, according to Ron Pawelko, Superior Graphite's treasurer. "I call up and say, 'What kind of hardware do I need?' They tell me, they bring it in and it works."

USConnect, based in Stamford, Conn., is a partnership formed in 1989 by five independent LAN integrators. "They [came together] so they could leverage each other's skills sets and fulfill multisite engagement contracts," explains Brad Whinney, vice president of marketing and business development at USConnect. The company's largest business is in LAN/WAN design and integration.

Every USConnect company, though, does not provide the same services. Some focus solely on systems integration, without offering education services. Others supply strictly application development services, but LAN/WAN remain common denominators in the majority of firms, Whinney says.

Today, the USConnect family includes 26 member firms covering 53 metropolitan areas in the U.S. and Canada. USConnect approached companies in various cities, which then purchased shares to join the USConnect consortium. Each company uses the USConnect name in conjunction with its own name or a city name. Member companies pay monthly dues in exchange for access to the services of USConnect and fellow members, Whinney explains.

USConnect's reach and expertise made sense for Legal Copies International, Inc. of Atlanta. It hired the integrator to install products such as Netware SFT III from Novell, Inc., build servers and install other software at locations in more than 20 cities.

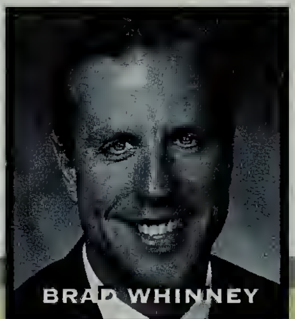
USConnect impressed Legal Copies with its knowledge of Novell's Netware 4.1 and its willingness to share its expertise with Legal Copies' IS staff, explains Todd Pennington, wide-area systems coordinator at Legal Copies.

There were some problems, too. "We've had our occasional disagreements," Pennington admits. "At times, there has been a lack of speedy response to what we perceive to be emergencies."

USConnect knows that such disagreements generally can be resolved by approaching customer relationships with respect. "The thing that we're focusing on is making sure that [the customer] understands that we are there to support the IS department, and we are not out to compete with them," Whinney says.

Pawelko at Superior Graphite agrees: "They taught us how to set up the factory in Chicago, and we went in and set up the other factories on our own." •

—Amy Malloy


BRAD WHINNEY

1994 total revenue: $216,000,000
1994 integration revenue* (services only): $80,676,000
Integration employees: 1,350
Large commercial contracts: Sprint Business (Kansas City, MO), Elf Technology (Mercer Island, Wash.)
Tops the charts: Project's compatibility, integration experience, final price relative to performance
Characteristics: Bottom-up integrator, 83% of business is North American
*North American

"I DON'T THINK [CSC] UNDERSTOOD OUR EXPECTATIONS AS WELL AS THEY SHOULD HAVE," SAYS LESTER THIERWECHTER OF BAKER & TAYLOR, INC.

BIG britches

WHY DO THE LARGEST SYSTEMS INTEGRATORS IN THE BUSINESS RANK RELATIVELY LOW IN CUSTOMER SATISFACTION?

By Julia King

Big is by no means best when it comes to choosing a systems integrator. That's the consensus of customers of some of the billion-dollar integration firms, including Andersen Consulting, Computer Sciences Corp. (CSC) and Electronic Data Systems Corp. In *Computerworld's* customer satisfaction survey of 25 systems integrators, all three companies consistently ranked below their competitors across a range of satisfaction criteria.

Curiously, though, many users who have complaints about these big integrators say their companies probably would hire the same firm again. The reason? Corporate politics.

"It's a golf-course business," insists Tim Bourgeois, an analyst at International Data Corp. in Framingham, Mass. The largest integrators "can all reference big deals that have worked out. So in the end, what it all comes down to is relationships."

For example, when one of the Big Six is involved in an auditing project at a client company, the company's financial officer frequently will lobby the CEO or another top decision-maker to use that firm on a systems integration project.

Another touchy issue, according to users, is that top executives' reasons for choosing an integrator often are different from business users' and IS staffers' reasons. Executives, some users say, tend to focus more on strategy and business plans, while users want to know about an integrator's specific skills and its ability to transfer those skills.

Conflicts occur — sometimes deep ones — between customers and the largest of the large systems integrators as projects progress. Specific criticisms raised by users include the following:

- A lack of technical expertise on the part of individual consultants.
- Inflexible project management methodologies.
- Inadequate knowledge transfer or user training.
- Continuous expansion of project scope.
- Inadequate understanding of customers' expectations and requirements.

Consider the case of Baker & Taylor, Inc., a $600 million book distributor. The Bridgewater, N.J., company is re-engineering its core business systems in a $20 million to $30 million contract with CSC in El Segundo, Calif., one of the largest systems integrators in the business.

As of November 1995, what was supposed to be a

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> "We thought we were hiring expertise, but we were paying them ... to become trained."
>
> *Mike O'Connor, University of Colorado Hospital Authority*

Photo by John Rae

On big jobs, "there is a hell of a lot more opportunity to make someone less than thrilled with you."

Robert "Skip" Savoia, Computer Sciences Corp.

Continued from page SI/7

15-month implementation of a new mainframe-based on-line order and distribution system was complete, but "a year late and over budget," says Lester Thierwechter, manager of systems programming.

What went wrong? Among other things, missed project deadlines and cost overruns. CSC's failure to heed the advice of internal IS staffers was another sore point. Thierwechter says that CSC insisted the packaged software application would meet Baker & Taylor's design requirements, for example, even though an internal study by the company's IS group had reached the opposite conclusion. "I don't think they understood our expectations as well as they should have," he says.

In another case, CSC took far too long to lay out precisely what is and is not included in a project, according to a vice president at a $250 billion Midwest manufacturing company. The manufacturing company had recruited CSC to build a new order-management system that would be tightly integrated with a credit system CSC already was building for the company. But the order-management system was never completed.

Instead, the vice president says, what his company received was a comprehensive report on the state of systems already in place. This was issued after what he calls a months-long "map-and-gap" process. This involved CSC "looking at the whole enterprise because the [new] order-management system had what we call 'hoses' to 40 other systems and they would have to build those integration links."

What's more, the vice president complains, the customer "gets the pleasure of paying [CSC] $1,000 a day" during the study process. "You're bleeding to death, and you don't know when the map-and-gap will end. Finally, you get sick of it and terminate [the contract]," he adds.

For what he insists are "political reasons," CSC is still working with the company on a software development project that does not include systems integration. (For this reason, the vice president requested that his name and the name of his company be withheld.)

The idea of building a new order management system also got the ax. Instead, the company bought Oracle Corp.'s client/server financial applications, which Oracle modified for the company.

THE COST OF COMPLEXITY

Robert "Skip" Savoia, CSC's vice president of industry practices, acknowledges that "there are a couple of truths" in the above examples.

But he also notes that larger integrators such as CSC are called in to work on some of the most complex projects, which are "more dramatic in scope" than those tackled by smaller firms. "When you look at the characteristics of that kind of engagement, you tend to have a longer period of implementation and a wider audience that you're interacting with, so there is a hell of a lot more opportunity to make someone less than thrilled with you," he says.

As for the need for up-front systems analyses, "you just can't slam-dunk a new system in," Savoia says. "There is an enormous hidden, built-in infrastructure that a company has built hooks into over 20 or 25 years. It's all spaghetti, and if you inadvertently interrupt a process, you could shut down a business."

Another oft-cited problem with large integrators is a lack of sufficient technical expertise in the systems and software they are hired to deploy.

Consultants with Andersen Consulting, for example, spent two years installing a clinical orders communications system at the University of Colorado's University Hospital in Denver. But for some of that time, the consultants were learning about the software on which they already were supposed to be experts.

HOW THE BIG GUYS RANK

HARDWARE VENDORS RATE HIGHER IN CUSTOMER SATISFACTION

LARGEST 5 HARDWARE VENDORS	Total North American integration revenue	Total integration revenue	Relative customer satisfaction (rank among 25 firms)
1. IBM Corp.	$6B	$9B	14th
2. AT&T	$1.05B	$1.75B	12th
3. Digital Equipment Corp.	$1B	$2.24B	7th
4. Hewlett-Packard Co.	$903M	$1.81B	3rd
5. Unisys Corp.	$302M	$1.26B	2nd

LARGEST 5 NON-HARDWARE VENDORS	Total North American integration revenue	Total integration revenue	Relative customer satisfaction (rank among 25 firms)
1. Electronic Data Systems	$7.37B	$9.96B	22nd
2. Computer Sciences Corp.	$2.27B	$2.58B	25th
3. Andersen Consulting	$1.68B	$2.40B	24th
4. SMS Corp.	$435M	$550M	15th
5. Ernst & Young	$410M	NA	19th

Source: *Computerworld* and ParaTechnology, Inc.
Note: Companies ranked by total North American integration revenue. See pages SI/17 to SI/19 for details.

"We thought we were hiring expertise, but we were paying them over $100 an hour to become trained along with the hospital staff," says Mike O'Connor, a telemedicine project manager with the University of Colorado Hospital Authority.

Keith Burgess, who is Andersen's managing partner of business integration, agrees that people need to be skilled for the tasks at hand. "But that doesn't mean that each project member from Andersen will be a veteran with 20 or more years of expertise in a particular subject area," he says. What each member will have is access to the appropriate expertise when it is needed.

CASE STUDY: EDS

CLIENT: World Airways, Inc., Herndon, Va.

THE PROJECT: Migrate several mainframe-based administrative systems, including accounting, sales and marketing and ticketing applications, to a client/server environment.

QUOTE: "The idea was for EDS to get the company started [on the new applications] and then they'd be handled by internal IS. EDS did train, but the training they provided was pretty skimpy."

— Clarence Johnson, director of information technology, World Airways

LONG EVALUATIONS

Another frustration is the time and energy integrators spend in the evaluation phase of a project. Clarence Johnson, director of information technology at World Airways, Inc., a specialty airline based in Herndon, Va., experienced frustration with Electronic Data Systems back in 1991 and 1992.

"They would frequently want to go through a big study and come up with a proposal that might be inches thick, when we were talking about something that would not be all that large," he recalls. "Since then, we've used smaller integration organizations."

As is the case with many of its jobs, EDS got the World Airways work by expanding its presence beyond a project in progress at one of the airline's sister companies — a common EDS practice some users complain about.

EDS offers no apologies. "I will not make any secret of the fact that, over time, our relationship with a customer can grow," says Barry Sullivan, an EDS corporate vice president. "While we are [at a customer site], we'll take opportunities to sell. I'm not ashamed of that. It's our business."

In the final analysis, a user's willingness to rehire a large integrator does not appear to be tied to any one indicator of customer satisfaction or dissatisfaction. Instead, most seem to take a warts-and-all hiring approach that, for better or worse, continues to make the already big integrators even bigger. •

CASE STUDY: ANDERSEN

CLIENT: University of Colorado Hospital Authority, Denver

THE PROJECT: A $6 million project to implement an on-line clinical orders system.

QUOTE: "Some of [Andersen's] staff consultants had no experience with the products we were installing. We hired them to educate the hospital staff, not educate themselves. The advice I'd give other hospitals would be to rely as little as possible on outside consulting and to cultivate skills and provide education and training for your own staff to successfully manage projects."

— Mike O'Connor, telemedicine project manager, University of Colorado Hospital Authority

King is a Computerworld *Senior Editor, Client/Server Applications Software.*

More than just hardware

By Steve Alexander

Technical expertise. That's the reason companies hire hardware vendors for systems integration projects, according to *Computerworld*'s systems integrator customer satisfaction survey. Unisys Corp. and Hewlett-Packard Co. ranked high in overall customer satisfaction, Digital Equipment Corp. and AT&T Corp. scored in the top half of the field of 25 integrators, and IBM came in at No. 14. (See chart on previous page.)

HARDWARE VENDORS GET HIGH MARKS FOR THEIR PERFORMANCE, BUT SUCCESS DEPENDS ON THE CUSTOMER.

But a project's success depends on more than technology, according to Malon S. Updike of Jefferson National Bank in Charlottesville, Va. The senior vice president of data systems says AT&T did exactly what it was asked, and if things didn't turn out right, it's the bank's fault for hiding its embryonic strategic plan from AT&T.

Jefferson National, which operates 100 branch banks in Virginia, hired AT&T Global Information Solutions (renamed NCR Corp. last month) to develop an Oracle database for the management of ad hoc financial reports. The problem was that the bank didn't share with AT&T its long-range plans for generating financial reports from branch banks hundreds of miles away at the click of a button.

"We didn't tell the systems integrator where we wanted to go, because we didn't want them to bid on all that," Updike confesses.

While the AT&T project turned out as requested, it didn't fit into the bank's evolving plan, irritating some bank executives.

The bank's concealment of its plans violated one of the key rules for making sure a systems integration project comes out right, says David Toub, Digital's worldwide strategic planning director for systems integration. That is: Make sure you have open communications with your systems integrator, because you're likely to get what you ask for.

A customer needs to define carefully a project's goals and objectives to the integrator or risk winding up with hardware that doesn't do the job. And, the customer needs to follow up on the integrator's promises or the project may spin out of control.

That's what happened at Quaker State Corp. when IBM was hired to install an AS/400 and integrate it with laboratory information management system software for Quaker State's Innovation Center, an oil-testing lab in Oil City, Pa. But Steve McNaughton, the center's systems operator and network administrator, says IBM couldn't find any appropriate software, so it recommended development tools instead. Trouble was, none of the tools worked satisfactorily, and Quaker State finally gave up on the 3-year-old project last spring and turned to a network of PCs.

IBM was paid for the project, but McNaughton learned Quaker State shouldn't have let the project continue for so long without results. He should have looked for an alternative solution sooner.

Hardware was not the issue for Kaiser Permanente, the Oakland, Calif.-based hospital and medical clinic operator, when it tapped Unisys for a 14-state electronic-mail system. "We relied on none of their hardware, but rather on their skills in configuring other parties' hardware," says Gary Wilkerson, a Kaiser senior planning analyst based in Atlanta.

Execution was smooth because the scope of the E-mail project already was defined when Unisys arrived on the scene.

Often, however, defining a project's scope is not enough. The California Department of Fish & Game had to spend time educating its integrator, Hewlett-Packard, on how to handle a geographic information system (GIS) database project.

The idea was to update information on the distribution and condition of fish and other wildlife throughout California in a GIS that would be used to respond to oil spills. Since the department already was standardized on HP equipment, the integration project fell to HP, too.

"Most [hardware] vendors don't have much experience with GIS applications," says John Ellison, GIS manager, California Department of Fish & Game.

Ellison identified the key HP contact person and has worked with that individual for most of the project. "So far, we've had no surprises," he says.

Hardware is often the reason for signing a contract, but other factors are responsible for success.

DISAPPOINTED WITH IBM'S PERFORMANCE ON A THREE-YEAR PROJECT, STEVE MCNAUGHTON OF QUAKER STATE ADMITS HE SHOULD HAVE LOOKED FOR AN ALTERNATIVE SOONER.

Alexander is a freelance writer in Edina, Minn.

Photo by Mark Bolster

Top-Down vs. Bottom-Up

Top-down:/ˈtäp-ˈdau̇n/ *adj* 1.integrators that are driven by boardroom decisions and focus on management consulting, applications development and facilities management

Bottom-up:/ˈbä-təm-ˈəp/ *adj* 1.integrators that are driven by new technology and focus on nuts-and-bolts implementation projects

IF ALL YOU NEED IS DEPENDABLE TRANSPORTATION, YOU DON'T BUY A ROLLS-ROYCE. SO WHEN YOU NEED HELP ON AN IS PROJECT, WHY SHELL OUT THE BIG BUCKS FOR A HIGH-PRICED CONSULTANT?

By Steve Alexander

When Kevin O'Byrne went looking for a systems integrator, he knew better than to pick one of the big guys.

"We needed someone to acquire equipment, test it, configure it to our specifications, ship it to the locations and install it," says O'Byrne, manager of branch automation at First Interstate Bancorp. in Los Angeles, which was acquired last month, pending regulatory and stockholder approval, by Wells Fargo & Co. "They didn't have to have any understanding of the development of the applications."

First Interstate picked MicroAge, Inc. of Tempe, Ariz., because it was allied with Compaq Computer Corp., the bank's hardware vendor, O'Byrne says. With offices in 13 states, from Texas to Alaska, First Interstate is using MicroAge to put office and sales automation applications on LANs in 450 branch banks. Plans to put them in 450 additional branches are on hold, pending the bank's acquisition.

When bids were taken, O'Byrne liked MicroAge for its hardware integration and project management capabilities, and because MicroAge offices are located close to the bank's branches. He attributes the project's success to the bank's careful outline of the project's scope: "We spent quite a bit of time and went into detail laying out the responsibilities of the integrator. We had a good, crisp understanding of who was doing what, and it served us very well."

WHY BOTTOM-UP?

Systems integration projects that don't involve business process re-engineering or corporate strategy often go to value-added resellers that also do integration work, such as MicroAge. While profit margins are typically lower for these "bottom-up" integrators, the firms play in a broad market, ranging from modest PC configuration to integrating office systems, such as First Interstate's project.

The difference between the two approaches is focus, insists Chris Koziol, president of MicroAge Infosystems Services, a subsidiary of MicroAge, Inc. Top-down companies focus on consulting, applications development and, in some cases, facilities management, while bottom-up firms focus on implementation.

"Bottom-up integrators often specialize around a piece of hardware, are allied with a hardware vendor or use only a limited number of vendors," says Carl Sellberg, a partner responsible for domestic IT work at New York-based Coopers & Lybrand. Top-down integration, he says, is driven from the boardroom, while bottom-up integration typically is driven by new technology.

Which way's up?

On average, customers are most satisfied with bottom-up integrators, with the "both" category coming in a close second. Satisfaction is driven, in part, by the type, duration and size of the project; the larger the project, the more chance of problems.

(Numbers correspond to the company's rank in overall customer satisfaction level. See page SI/17 for details.)

BOTTOM-UP

1. AmeriData Technologies, Inc.
5. USConnect, Inc.
9. The Future Now, Inc.
10. MicroAge, Inc.
11. Entex Information Services
16. Vanstar Corp.
17. Inacom Corp.

TOP-DOWN

4. Control Data Systems, Inc.
6. Price Waterhouse
8. Deloitte & Touche
13. Cap Gemini America, Inc.
15. Shared Medical Systems Corp.
18. Coopers & Lybrand
19. Ernst & Young
20. American Management Systems, Inc.
21. KPMG Peat Marwick
23. SHL Systemhouse, Inc.
24. Andersen Consulting
25. Computer Sciences Corp.

BOTH

2. Unisys Corp.
3. Hewlett-Packard Co.
7. Digital Equipment Corp.
12. AT&T Corp.
14. IBM Corp.
22. Electronic Data Systems Corp.

Source: *Computerworld* and ParaTechnology, Inc.

Often, the two types of integrators collaborate, adds Tim Wallace, vice president of professional services at The Future Now, Inc., a bottom-up service provider based in Cincinnati. Top-down firms sometimes outsource tasks such as desktop life-cycle management — buying, supporting and eventually replacing desktop PCs — to bottom-up firms.

"It's easier to move up the value chain than down it," claims Tom Martin, senior vice president of services at Entex Information Services, a bottom-up integrator based in Rye Brook, N.Y. "Our market is hard for [top-down integrators], because it has low margins and requires a lot of training, certifications and skill sets that are not in their organizations. They must invest in that to get lower margins than they get today, while, as we move up, we get higher returns."

DEVIL IS IN THE DETAILS

Not all customers, however, are as careful as O'Byrne. Jeffrey Bartels, IS project manager for Harmon Glass, a subsidiary of Apogee, Inc., based in Golden Valley, Minn., says he ran into trouble on an integration project with Entex precisely because he didn't specify the details of the job in advance.

Harmon Glass, which operates 270 auto-glass shops nationwide, asked Entex to recommend a way to implement a remote communications feature that would run on Windows for Workgroups at a suburban Minneapolis location. When technical problems arose, Entex was called in, but the results weren't satisfactory. Harmon and Entex agreed to split the bill for Entex's services. "We should have set some guidelines, and we didn't do that," Bartels says.

Again, when Harmon hired Entex to install an E-mail gateway to link its Minneapolis and Orlando, Fla., offices, the E-mail gateway became operational on schedule, but a problem in synchronizing user lists took several more weeks to resolve.

"I love Entex for equipment purchases, but I was dissatisfied with their systems integration," Bartels says. "I'd have a tough time going back to them."

TAKE CHARGE

A bottom-up integrator is often a partner who will take charge of a project and make life easier.

Under a three-year, $15 million contract that began in January 1995, MicroAge consolidated work that credit-card firm Visa International of Foster City, Calif., formerly had done by three companies.

Hal Rhineberger, director of Visa's acquisitions planning, says he picked a bottom-up vendor to buy, configure, test and ship IBM PCs with Visa software to banks in 42 countries, "because I was looking for nuts-and-bolts building, not planning and consulting."

The bottom line, says O'Byrne of First Interstate, is to know what kind of integrator you need. "We needed a bottom-up, hands-on integrator."•

Alexander is a freelance writer in Edina, Minn.

Avoiding the D word

By Candee Wilde

A BREAKDOWN IN RELATIONS WITH YOUR SYSTEMS INTEGRATOR CAN BE MORE ACRIMONIOUS THAN A DIVORCE. HERE'S HOW TO KEEP THE PROJECT ON TRACK AND OUT OF THE COURTROOM.

A systems integration contract gone wrong has all the elements of a nasty divorce. Both sides inflict and endure pain; they lose sleep, money and time. It often takes time to pick up the pieces and start again.

Contracts between integrators and clients are complex, and relationships sour for the same reasons that married couples split up. Unrealistic expectations, lack of communication and a stubborn refusal to compromise can set off a domino effect that brings projects crashing down.

Take, for example, Electronic Data Systems Corp. In a highly publicized dispute late last year, EDS was accused of fraud and civil theft by Florida's attorney general, who is seeking to bar EDS from working in the Sunshine State. In a separate but related proceeding, an arbitrator has ruled that EDS is entitled to some $50 million in payment from the state for work on a state project.

Or take Andersen Consulting. It's embroiled in several lawsuits with former clients that have alleged fraud, incompetence and neglect. In some of these cases, Andersen is suing for nonpayment.

In Andersen vs. O'Neal Steel, Inc., O'Neal is seeking an award of $38 million, plus punitive damages, from Andersen in a suit filed in Birmingham, Ala., in September 1994. The suit claims the Chicago-based consultancy misled the Alabama steelmaker about the cost, duration and best method for redesigning its computer system to support re-engineered business operations.

One day before O'Neal filed suit in Birmingham, in what O'Neal attorney Anne B. Stone describes as "a race to the courthouse," Andersen filed suit in Atlanta, seeking fees and expenses it says are due under the contract.

"The project got behind schedule, and the number of hours O'Neal was estimated to have to devote was grossly underestimated," says Stone, a partner with Walston Stabler Wells Anderson & Bains in Birmingham. When the computer system was installed in O'Neal's Atlanta office, Stone alleges, "it did not work. It caused a complete business interruption."

O'Neal and Andersen tried unsuccessfully to address their differences. Bob Prince, Andersen's managing partner for partnership matters, says the contract called for Andersen to install the new system in all 23 of O'Neal's district offices. But because O'Neal stopped the project before it was completed, Prince says the real issue in the case is, "What would have happened to our contractual commitment if we had been allowed to continue?"

One of O'Neal's business objectives was to completely re-engineer its distribution system. However, "it was clear that a large number of people did not want to go through the changes that were required to make things work," Prince says.

When O'Neal made allegations that Andersen was in default on the contract, Prince says, it was clear to Andersen that the client relationship was broken and there was no longer mutual trust. "In that situation, we had to make a decision about how to best protect Andersen Consulting's interests," Prince says, which led to filing the suit to collect its fees.

TAKING PRECAUTIONS

Problems such as O'Neal's can be avoided.

Don't agree to pay for a project based on time and materials; pay only for systems that work. That nugget comes from Don Blumberg, CEO of D.F. Blumberg & Associates, a Fort Washington, Pa.-based consultancy that works with systems inte-

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"The best time to talk about conflict resolution is when both sides are interested in initiating the relationship."

Harry Glasspiegel, a partner in the Washington, D.C., law firm of Shaw, Pittman, Potts & Trowbridge

Illustration by Elizabeth Lada

Avoiding

Continued from page SI/11

grators and other businesses to help develop business plans and improve productivity.

"Andersen rarely makes a fixed-price implementation," Blumberg notes. "They charge for time spent, not the results they produce. The effect is, they never get done." The practice is common, particularly if the scope of a project is not well-defined. EDS and others, such as Vanstar Corp. of Pleasanton, Calif., work on an hourly basis, too, he says.

Blumberg says clients must protect themselves against spending huge sums and having nothing to show for it. To do that, they must define exactly what they want, give a clear scope of the work and decide what the deliverables will be — then settle on the price they are willing to pay for the job.

BROKEN PROMISES

Andersen's Prince says some disgruntled clients ask for huge financial settlements when they sue, hoping to scare the integrator into an out-of-court settlement. A lawsuit filed by Universal Oil Products (UOP), a Des Plaines, Ill., engineering company that provides technology and products to build oil refineries, is a case in point, Prince says.

UOP has charged Andersen, which it hired in 1992 to streamline UOP's engineering specifications and cost-estimating processes and to develop client/server software applications, with breaking promises, incompetent and grossly negligent performance and "provision of defective and useless systems."

The contract was terminated in 1993, says Eugene Schmelzer, director of UOP's support center, "when we became convinced that Andersen was not going to be able to effectively complete it."

"[UOP] filed a lawsuit against us for $100 million, which is an absolutely preposterous amount," Prince says. "Our fees on the engagement were $8 million."

The suit, filed in May 1995, alleges Andersen "represented that it would 'assume responsibility for the price, schedule and quality of deliverables,' " and should "be held to those promises."

UOP has hired another integrator to continue the project and is "very happy with the relationship," Schmelzer says. UOP is working with the new integrator more effectively because "we have been able to set up a close relationship at the working level, not just at the management level."

In contrast, Schmelzer says, Andersen kept UOP personnel "at arm's length" during the project. UOP's suit alleges that in November 1992, Andersen estimated it would take 55,000 hours to finish developing UOP's cost-estimating system. By the next September, that estimate was 88,700 hours, the suit says.

UOP and Andersen might have avoided litigation if the precise goals of the project and the amount of time and money UOP was willing to invest had been agreed upon specifically up front. Consistent and frequent communication would have kept the air clear and tempers in check.

THE STATE OF FLORIDA VS. EDS

Bitter barely begins to describe the public dogfight that erupted several years ago — and is still going on — between EDS and the state of Florida. The sides have sued each other over an $88 million, three-year project initiated in 1989 to integrate Florida's various welfare payment systems.

In a suit filed in October 1995, Florida's attorney general charged EDS with fraud and civil theft, alleging that EDS built a computer system for the state's Department of Health and Rehabilitative Services (HRS) that it knew had inadequate capacity, delayed telling the department about the shortfall and then misrepresented the reasons for the problem.

The suit also alleges an EDS employee testified falsely before the state legislature to collect payment for the system. "Under Florida law, this spells F-R-A-U-D," says Steve Parton, a lawyer in the attorney general's office.

But EDS calls these latest charges "frivolous" and says the state brought them only after a special master hearing, or arbitration, of EDS' nonpayment suit recommended that HRS pay EDS about $50 million.

The latest suit would not have been filed, Parton says, "if EDS had gone to HRS and said, 'The capacity problems are because we screwed up.' But it's not good for a big systems integrator like EDS to say, 'We didn't do our job. Even though we studied the design, we really didn't know how it functioned.' "

But an EDS spokesman says the courts have had some questions about "the expertise of some of the people at HRS to administer this type of contract."

The lesson, once again, is that a sense of partnership and shared goals is essential. Underlying the comments from both parties is the realization that better communication might have mitigated problems enough to have avoided legal action.

Fortunately, such complex legal snarls are rare and both sides have significant incentive to avoid them, says Harry Glasspiegel, a partner in the Washington, D.C., law firm of Shaw, Pittman, Potts & Trowbridge, which represents both integrators and clients in outsourcing systems integration contracting.

These transactions are among the most complex legal agreements companies can enter, short of a merger or acquisition. Too many times, Glasspiegel says, discussions of potential obstacles are glossed over.

"The best time to talk about conflict resolution is when both sides are interested in initiating the relationship and have incentive to establish fair and reasonable approaches to dealing with issues that might arise in the future," he says. "The success of these transactions is almost always in the details." •

Wilde is a freelance writer in Easton, Conn.

Tips on avoiding a lawsuit

1. **Pick the right solution and the right integrator.** You must have the right fit to begin with, because a contract will not protect you.
2. **Control the contract drafting process.** Take the lead in developing a contract that covers all aspects of your project.
3. **Be clear on all aspects of the job.** Specify performance obligations, deliverables, acceptance criteria and the like.
4. **Be specific on respective responsibilities.** For example, determine who is responsible for managing third-party software.
5. **Select key project managers on both sides.** Establish a format for project-management reviews and dispute resolution procedures.
6. **Know who you are hiring.** Get as much information as possible about key individuals the integrator plans to assign to your project team.
7. **Keep turnover low.** Contracts for long-term projects should include provisions to minimize turnover of key staff members.
8. **Be very clear about pricing.** Tie payments to deliverables and the achievement of specified milestones.
9. **Negotiate reasonable warranties.** Determine who is responsible for software maintenance and support.

Source: Harry Glasspiegel, a partner in the Washington, D.C., law firm of Shaw, Pittman, Potts & Trowbridge

WHEN TEMPERS FLARE

THINGS OFTEN FALL APART BECAUSE NEITHER SIDE WANTS TO TALK. NOT SO AT AMS.

When Larry McNabb inherited a systems integration project that Bank of America's cash management department was working on with American Management Systems, Inc., things were not going well. The computer system wasn't delivering the promised results, and tempers were rising between personnel from AMS and the bank.

After the Bank of America group executive vice president saw what he was dealing with, he sat down with AMS vice chairman Patrick W. Gross in the bank's San Francisco office. McNabb told Gross he saw three options for the problem-plagued project: It could sink into a finger-pointing fracas, it could be terminated, or both sides could admit that mistakes had been made, forget about placing blame and try to work together as partners to straighten things out.

"I told him I'd rather be partners," McNabb says, "and he says he would too. That was in 1987, and we've been partners ever since."

The lesson? Systems integrators who treat clients as partners and lay their cards on the table early and often are likely to head off "situations" before they become problems, says Paul A. Brands, AMS' vice chairman and CEO. "I don't think there's any magic associated with it."

AMS was voted tops by clients in problem resolution in *Computerworld*'s systems integration customer satisfaction survey. (See page SI/18.)

A practical step AMS takes to keep projects running smoothly is scheduling frequent meetings between senior AMS executives and the AMS project team assigned to a client. The client often participates in these meetings, which allow AMS to "identify major risks, potential problems and concerns either side might have. Often, we resolve problems before they come up," Brands says.

The moral of this story: An ounce of prevention is worth a ton of cure.

— *Candee Wilde*

Who is the best at problem resolution?

1. **American Management Systems, Inc.**
2. **AmeriData Technologies, Inc.**
3. **Control Data Systems, Inc.**
4. **KPMG Peat Marwick**
5. **Price Waterhouse**

Note: Systems integrators are ranked according to customer satisfaction survey results.

Source: *Computerworld* and ParaTechnology, Inc.

a wild ride

Beware who you contract with when you go shopping for an R/3 integrator.

Rosemary Cafasso

Joyce Young, director of information technology and services at Tellabs, Inc., a telecommunications products manufacturer in Chicago, put her signature on a SAP AG software contract at 4 p.m. Thursday, September 28.

When she got to her desk at 9 a.m. Friday morning, she had 15 voice-mail messages from systems integrators looking to help Tellabs install R/3, SAP's wildly popular client/server system.

SAP-Certified Integrators

Andersen Consulting
Cap Gemini America, Inc.
Coopers & Lybrand
Computer Sciences Corp.
Ernst & Young
IBM Corp.
Deloitte & Touche
KPMG Peat Marwick
Price Waterhouse

Companies on the list of 25 top integrators that SAP has certified in R/3 applications, including all areas of financial, logistics and human resources.

Source: SAP America, Inc.

Like hundreds of IS executives, Young is caught up in the SAP frenzy — a market in which 5,000 new R/3 consultants hit the streets in 1995 alone. The grand total to date: 4,500 SAP R/3 user sites and more than 15,000 consultants worldwide. SAP AG estimates that an average R/3 contract costs about $1 million. With consulting fees, the price tag could rise to $5 million.

The SAP integrator market is expected to generate $5 billion in revenue in 1996, up from about $2 billion in 1995, according to the Gartner Group, a research and consulting firm in Stamford, Conn.

Demand exceeds supply

The SAP hullabaloo has created a dilemma for many companies. Because of R/3's tremendous popularity, the supply of qualified consultants has yet to match the demand.

"With R/3, there's a degree of risk because the [consulting] companies out there haven't been working on it very long," warns Barry Day, global SAP leveraged services manager at Du Pont Co. in Wilmington, Del., a major SAP account that will be ramping up R/3 use this year.

Andy Hefer, information systems director at Hydro Agri North America, Inc., Tampa, Fla., knows what Day is talking about. He had some initial trouble finding qualified SAP programmers. "Through trial and tribulation, we figured out who knew what they were talking about," he says.

Hefer recalls one programmer who professed to be well versed in Abap, the SAP programming language. But when the IS staff booted up some of his software, they could barely get it to run. The company invested close to $40,000 for the botched work, Hefer says.

Hydro Agri now works with KPMG Setac, a division of KPMG Peat Marwick that specializes in SAP consulting, and some carefully chosen independent local contractors. Bottom line for Hefer: "You need to find people you can really trust, and you can't be afraid to throw people out."

Cleaning up its act

SAP is working to improve the overall quality of the services provided by systems integrators. The company has several efforts under way, including an authorized partner program, to help customers find the right integrators. (See "SAP-Certified Integrators," this page.) "We want to get rid of people going around saying they are R/3 experts when they are not," says Manfred Heisen, director of corporate alliance management for SAP.

Tellabs' Young, who eventually signed a deal with Deloitte & Touche's Consulting Group/ICS in Chadds Ford, Pa., says meeting the team members ahead of time was important. "ICS flew people in from San Francisco and Seattle," Young says.

SAP veterans also say that companies need to consider new approaches to get the R/3 job done.

Florida Crystals, Inc., a distributor of sugar products, signed a contract in 1994 with Andersen Consulting in part because Andersen agreed to split the cost of designing an R/3 template, says Rodney Rogers, vice president of operations at the Palm Beach, Fla., company.

Rogers says the deal worked out for both parties: Florida Crystals got a prototype to launch a pilot project and Andersen got to keep the work it did and use it with other clients. •

Cafasso is a freelance writer in Walpole, Mass.

Options for structuring SAP contracts

1. **Value-based contracts.** These contracts tie the consultants' fees to specific objectives. It may be difficult to pinpoint goals in such multifaceted projects, but these deals give the integrators an incentive to work hard.
2. **Sliding scale fees.** Be willing to include "green" R/3 consultants on the team, but pay precious little for them until they come up to speed.
3. **Pay as you go.** Agree to a certain rate for the project's first phase, when the need for R/3 expertise will be highest. Then cut the rates as you build your own internal R/3 skills.

Source: Industry analysts and R/3 customers

> "You need to find people you can really trust, and you can't be afraid to throw people out."
>
> *Andy Hefer, Hydro Agri North America, Inc.*

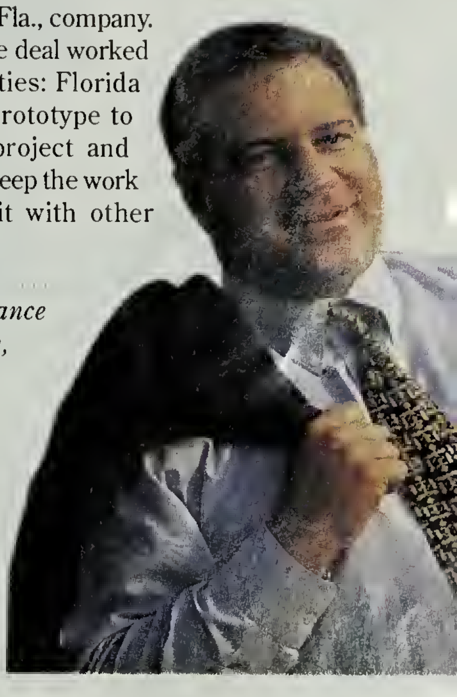


Photo by Chris Coxwell

Selling the 'net

EVERYONE IS LOOKING TO MAKE MONEY WITH ELECTRONIC COMMERCE. INTEGRATORS MAY BE AMONG THE FIRST TO CAPITALIZE.

Illustration by Steve Munday

By Linda Wilson

Sensing explosive growth, systems integrators are scrambling to develop Internet-specific business practices. The services range from simply reselling hardware and software to architecture design and business-process consulting.

The types of business that integrators are scoping out range from simple Web-server installations and home-page designs to complex electronic commerce strategies and applications. But, because the Internet, particularly the World Wide Web, is still nascent, most integrators don't have a lot of clients yet.

"There is more hype than anything else," says Bonnie Digruis, a vice president at the Gartner Group, Inc., a research firm in Stamford, Conn.

Most would-be clients are just beginning to think about the commercial potential of the Internet, and they are beginning slowly.

SOUP TO NUTS

While most integrators are evolving their Internet business, approaches vary widely. Large consulting firms tend to offer a soup-to-nuts approach, providing everything from consulting on business objectives and strategy to the design and implementation of a specific information systems application.

Other niche players offer a much more narrow scope of services, focusing on integrating technology platforms or creating home pages.

KPMG Peat Marwick in New York is a soup-to-nuts integrator. "We focus on business solutions first and then provide technology solutions," says Robin Palmer, partner and national service line leader for the electronic commerce group.

Consistent with its focus as a management consulting organization, KPMG takes a broad look at a customer's business objectives and then looks at how the Internet can support those objectives. "If all you want is someone to create a home page, we are not the guys," Palmer says.

At the other end of the continuum from KPMG is AmeriData Technologies, Inc. AmeriData launched its Internet service, which focuses on home-page design and server installation, in August 1995.

Lake Superior College in Duluth, Minn., turned to AmeriData for a quick and cheap solution for getting on the Web.

"I wanted a turnkey operation for a Web server. I wanted someone with experience who could show me what the procedure is for setting up a Web page," explains Dan Pioro, campus technical coordinator at Lake Superior College, a 1,000-student school.

AmeriData installed a Compaq Computer Corp. server, Web software from Netscape Communications Corp. and Microsoft Corp.'s Windows NT operating system software. From its office in Minneapolis, AmeriData also set up the software remotely and provided instruction on using the system and developing Web pages. The package cost $7,000, which included a 25% discount for state of Minnesota customers, to which the college was entitled as part of a blanket contract between the state and AmeriData.

USConnect, Inc. in Stamford, Conn., offers services somewhere between AmeriData and KPMG Peat Marwick. The company, which is a consortium of 26 independent network integrators, focuses on the design and implementation of technical solutions, ranging from servers and firewalls to specific applications. It steers clear, however, of the larger business-strategy issues. Because each of its member firms is independent, services may vary slightly from region to region, although the consortium is now working to develop a standard methodology.

The big-dollar market for integrators, obviously, is in elaborate and expensive services, such as setting up new Web-based businesses or developing on-line services for existing businesses. And integrators are as eager to provide these services as customers are to purchase them.

For example, Digital Equipment Corp. has been working with a bank, which it declined to identify, to develop an application that will allow consumers to apply for a checking account via the Web. The bank is interested in the Web because it believes it is an ideal way to reach young consumers, an important source of new customers.

Deciding which integrator to choose depends, in large measure, on the scope of the project. If you have elaborate plans or want to delve into business process and strategy issues, choose a large player, such as one of the Big Six, Digital or IBM. If your plans are small in scope, a niche player may suit your needs.•

Wilson is a freelance writer in Glen Ellyn, Ill.

MCI'S ONE-STOP SHOP

MCI Communications Corp. wants to be your one-stop information technology supplier.

That, in a nutshell, explains why the telecommunications giant late last year paid $1 billion for Toronto-based SHL Systemhouse, Inc.

MCI plans to package SHL's expertise, third-party client/server applications such as Oracle Corp.'s financial systems, and its own voice and data services to furnish users with what it calls enterprise management services.

"We'll bundle network activity, applications licensing, help-desk support and infrastructure to provide users with whatever applications they want on a per-workstation basis," says Greg Jacobsen, SHL's executive vice president of strategy and markets and a member of MCI's executive management team.

On the applications side, MCI's partners so far include Oracle, PeopleSoft, Inc. and Microsoft Corp., according to Jacobsen.

MCI, based in Washington, D.C., will position itself as an "information utility," Jacobsen says. Its outsourcing services will go beyond those offered today and include everything from providing users with a data dial tone and building and maintaining companies' Internet home pages to assuming "total responsibility" for a company's business applications and the business processes they support.

Last year, SHL signed a five-year, multimillion dollar outsourcing agreement with Tupperware Corp. in Orlando, Fla. So far, its activities have included developing the company's Internet and on-line services strategy, including the creation of Tupperware's home page on the World Wide Web.

On the network side, Jacobsen also foresees MCI and SHL creating "virtual electronic commerce" networks. These networks would link trading partners, all of whom could complete their individual business processes within a network-based business application.

Still unanswered, however, is the question of just how ready businesses are to turn over such a wide variety of mission-critical functions to an outside firm.

— Julia King

PLANETARY PROJECTS

Going global

By Arielle Emmett

SUCCESSFUL GLOBAL INTEGRATION DEPENDS ON GOODWILL, A SENSE OF MISSION AND AN APPRECIATION OF CULTURAL DIFFERENCES.

Vaughn Hovey knows what's involved in a global integration project. A few years ago, the manager of IT supplier and alliance management at Eastman Kodak Co. was involved in an integration project to consolidate 17 data centers in the U.S., Canada, Germany, France, Japan, England, Brazil and Mexico down to seven.

Kodak chose IBM for the three-year job in 1990 because of its global reach. IBM's Integrated Systems Solution Corp. (ISSC) based in Somers, N.Y., coordinated its work with IBM units in Europe and Japan. "We were looking for one global supplier who could be flexible in working relationships and provide common processes around change and problem management," Hovey says.

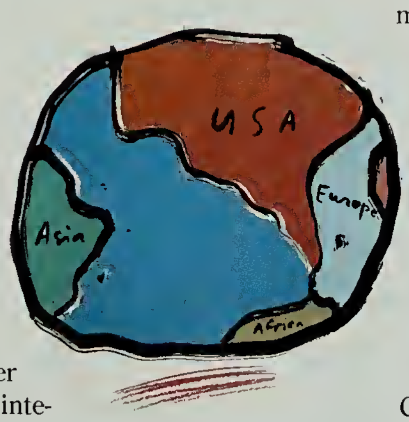
"The data center operations included multiprotocol network connections, a Pan-Asian, Pan-European network and physical backbone management," says Gordon Myers, ISSC's general manager of consulting services and managed operations. "In addition," he notes, "we did logical network management in Europe, RS/6000 server implementations in Latin America and LAN-based electronic-mail management in North America."

"Migration went virtually without a hitch," Hovey recalls.

The cost? Upwards of "hundreds of millions," Myers says. "Kodak was the first large company to engage in a contract of this type."

WHAT IT TAKES

With Latin America in the throes of massive privatization, China building new IT infrastructure and American and European companies scrambling to gain better control of worldwide subsidiaries, integrators say the push for global integration is proceeding rapidly toward a tighter, if not more recentralized, vision of IS.



Globally, the systems integration market is growing at an annual rate of 14%, according to Input, a research firm based in Mountain View, Calif. Top integrators report that many global integration projects are now in the eight-figure range.

"In the past, most manufacturers and business partners worked within a confined area; they focused within a state or country," notes Bill McCracken, general manager of marketing for IBM PC Co. "Now customers need to expand their scope; they need global networks to service their own businesses, and they have to respond," McCracken says.

Some companies, such as Cisco Systems, Inc., already have worldwide private or value-added networks in place but require major upgrades to new databases and functional business applications, especially in client/server.

Cisco Systems' eight-month worldwide rollout of Oracle databases and applications — a complete revamp of its business computing — cost $10 million and involved more than 1,200 users, 10 primary sites in the U.S., Canada and Japan, and more than 100 corporate sales offices, says Peter Solvik, chief information officer for the $3 billion internetworking company headquartered in San Jose, Calif.

The company chose KPMG Peat Marwick as the primary integrator for the project. Oracle Services in Redwood Shores, Calif., a professional services division of Oracle Corp., was selected as a technical subcontractor to provide performance tuning and development standards. The project involved installing and customizing all the Oracle applications — from order entry to manufacturing to financials, about 14 modules in all — and making them accessible from Cisco's San Jose computing

Continued on page SI/16

Illustration by Lilla Rogers/SIS

Going global

Continued from page SI/15

facility to global users across the company's worldwide private network.

A team of 100 professionals from KPMG, Oracle Services, Cisco and outside consulting firms coordinated the project, handling project management, applications development, business function analysis and technical support. For both Canada and Japan, the design work was done in San Jose.

A project such as this requires more than a passing interest from the top. "[Cisco's senior] management backed the project with dollars and freed up senior people in the organization to make it happen," says Mark Lee, KPMG's senior manager of strategic services consulting.

"They had a sense of urgency," Lee says. "[It's my impression that] when clients don't have a sense of urgency, and they don't have enough full-time people on the [integration] job, projects tend to fail."

"To my knowledge, there's never been a core system legacy replacement done for an entire corporation in eight months," says Cisco's Solvik. "It's very successful; we're on time, within budget and meeting the core objectives."

WHEN KODAK NEEDED AN INTEGRATOR TO CONSOLIDATE DATA CENTERS AROUND THE WORLD, IT TURNED TO IBM. "MIGRATION WENT VIRTUALLY WITHOUT A HITCH," SAYS KODAK'S VAUGHN HOVEY.

BALANCING ACT

In many cases, clients do not understand what is required to handle the corporate politics of a global rollout, many integrators say. At the same time, integrators tread a fine line when they impose a standard that corporate headquarters has approved in a country's branch office that prides itself on its autonomy.

"There is a difference between true multinational companies and global companies," observes Frank Callan, a vice president of global business development with Electronic Data Systems Corp. based in Plano, Texas. "Typically, global companies' reporting lines are different; their products drive their individual geographies. By contrast, multinationals have geographies that are more autonomous and choose which products move into various markets.

"As multinationals struggle to move toward the global mind-set, [local geographies] feel left out of the mainstream," Callan observes. "Integrators can get caught up in political battles, and you start to see a pushback — a reluctance of the local geographies to adopt what headquarters has dictated."

Both large and medium-size clients should be looking for global integrators that understand and can handle these subtleties — and can attack a worldwide challenge with a common set of methodologies and practices, Callan says.

But respecting differences is trickier than it may seem. Countries like Japan don't accept imported business practices. "The way you do invoicing and handle the tax system is unique in Japan," says George Kadifa, group vice president for manufacturing practices, Oracle Services. The dilemma is "how to ensure that you design business processes that are global in nature, but still take care of local requirements, [such as] different geographic requirements," he says.

"There is the major issue of international coordination," Kadifa says. "You've got to avoid duplication and inefficiencies. But how do you ensure that local requirements are met while you're not creating an independent solution as you go?

"It requires complex methodology and structure to manage global rollouts," Kadifa says.

The methodology involves the implementation of the integrator's plans at the systems and technical level, the network architecture level, the data repository level, and finally at the people level of operations and training.

DIFFERENT APPROACHES

Global integrators and clients have varying solutions. A company such as Omaha, Neb.-based Inacom Corp., which is a shareholder in the Paris-based joint venture International Computer Group, says that global projects work best when large local integrators manage each location.

"Typically, we're working with the largest systems integrator in each country with the most depth," says Chris Freiwald, president of Inacom's international division.

Cap Gemini Sogeti, a French company with operating units in the U.S. and Europe, has a different idea. "Our approach to staffing an international job is to have our local operating units form a global team," says Mike Meyer, executive vice president of Cap Gemini America, Inc.

"About three years ago, we made a $40 million investment to become more transnational, to adopt a common language, English, for all our documentation and business correspondence, and to adopt common service offerings no matter which country [we] go into," Meyer says.

Large companies want global staffing muscle and centralized control, he argues. "It makes us more sensitive to the marketplace. More and more companies are putting one global project manager in charge; they want to work with a global firm on a worldwide basis — what's implied by that is the strong desire to have us look and feel and act as one company." Gemini accomplishes this by using a common methodology and quality management system across all its operating units.

Perhaps most important to the success of a project is being sensitive to cultural differences. "Americans typically make assumptions about [the way other countries operate], especially if it's an American company abroad," says Brad Callahan, a partner at Ernst & Young in Minneapolis.

Callahan cites a case of a U.S. manufacturer that built a distribution and consignment inventory system in Europe based on a California-flavored model. "The company lost about 12 months of progress [because it] assumed that what was true for California was true for the Europeans.

"That's the kiss of death — not to take time to involve each of the countries affected and to get the full buy-in of the client and its local hubs," he insists. •

Emmett is a freelance writer in Wallingford, Pa.

Top Five Global Integrators

(Ranked by % of total integration revenue derived outside North America)

1.	**Unisys Corp.**	**68%**
2.	**Price Waterhouse**	**65%**
3.	**Control Data Systems, Inc.**	**60%**
4.	**Digital Equipment Corp.**	**55%**
5.	**KPMG Peat Marwick**	**55%**

Source: ParaTechnology, Inc.

Photo by Bob Mahoney

LISTENING TO THE CUSTOMER

When making any major purchase — a car, a house or the services of a systems integrator — it's always helpful to talk to people who have been through the same experience. The more information you have, the better decision you will make. That's why *Computerworld* asked more than 1,000 information systems managers for input on how well their integrators delivered the goods.

The goods, in this case, are 22 specific criteria, ranging from technical competence to personal relations. We gathered the criteria into three categories: business practices, (displayed in green), project management (orange) and technical performance (purple). These three categories were then combined to create a single ranking called overall satisfaction (shown in red). Aggregated customer satisfaction ratings are on this page, and details for the categories are on page SI/18.

METHODOLOGY

The 25 companies in this special report were selected from a list of the largest 100 systems integrators. The list of 100 was compiled by ParaTechnology, Inc., a Bellevue, Wash.-based market research and consulting firm that focuses on customer and vendor IT strategies. ParaTechnology was *Computerworld*'s partner in this project.

To qualify for the list of 100, integrators had to be based in North America — but not necessarily owned by a North American parent — and derive more than 50% of their total integration revenue from commercial, not government, contracts.

The selection of the 25 companies was based on ParaTechnology's estimate of the service component of the company's North American systems integration revenue for the most

Continued on page SI/18

INDUSTRY BREAKDOWN

MANUFACTURING	20%
BANKING/FINANCE	12%
HEALTH CARE	11%
RETAIL	5%
INSURANCE	5%
TELECOMMUNICATIONS	5%
TRANSPORTATION	3%
PUBLISHING	2%
AUTOMOTIVE	2%
LEGAL	2%
WHOLESALE	2%
REAL ESTATE	1%
OTHER	30%

Satisfaction Rankings of Systems Integrators

	OVERALL SATISFACTION	= BUSINESS PRACTICES	+ PROJECT MANAGEMENT	+ TECHNICAL PERFORMANCE
1	AmeriData Technologies, Inc.	Control Data Systems, Inc.	AmeriData Technologies, Inc.	AmeriData Technologies, Inc.
2	Unisys Corp.	MicroAge, Inc.	Unisys Corp.	Unisys Corp.
3	Hewlett-Packard Co.	Unisys Corp.	Hewlett-Packard Co.	USConnect, Inc.
4	Control Data Systems, Inc.	AmeriData Technologies, Inc.	Control Data Systems, Inc.	Hewlett-Packard Co.
5	USConnect, Inc.	Price Waterhouse	Price Waterhouse	The Future Now, Inc.
6	Price Waterhouse	Hewlett-Packard Co.	USConnect, Inc.	MicroAge, Inc.
7	Digital Equipment Corp.	Digital Equipment Corp.	Deloitte & Touche	Digital Equipment Corp.
8	Deloitte & Touche	Deloitte & Touche	Digital Equipment Corp.	Entex Information Services
9	The Future Now, Inc.	KPMG Peat Marwick	MicroAge, Inc.	IBM Corp.
10	MicroAge, Inc.	Entex Information Services	Entex Information Services	AT&T Corp.
11	Entex Information Services	AMS*	The Future Now, Inc.	Price Waterhouse
12	AT&T Corp.	Cap Gemini America, Inc.	Shared Medical Systems Corp.	Control Data Systems, Inc.
13	Cap Gemini America, Inc.	AT&T Corp.	Cap Gemini America, Inc.	Deloitte & Touche
14	IBM Corp.	The Future Now, Inc.	Coopers & Lybrand	Inacom Corp.
15	Shared Medical Systems Corp.	USConnect, Inc.	AT&T Corp.	Shared Medical Systems Corp.
16	Vanstar Corp.	IBM Corp.	Vanstar Corp.	Cap Gemini America, Inc.
17	Inacom Corp.	Ernst & Young	IBM Corp.	Vanstar Corp.
18	Coopers & Lybrand	Shared Medical Systems Corp.	Electronic Data Systems Corp.	Ernst & Young
19	Ernst & Young	Coopers & Lybrand	Inacom Corp.	Electronic Data Systems Corp.
20	AMS*	Inacom Corp.	Ernst & Young	AMS*
21	KPMG Peat Marwick	Vanstar Corp.	AMS*	KPMG Peat Marwick
22	Electronic Data Systems Corp.	Andersen Consulting	SHL Systemhouse, Inc.	Coopers & Lybrand
23	SHL Systemhouse, Inc.	Computer Sciences Corp.	KPMG Peat Marwick	SHL Systemhouse, Inc.
24	Andersen Consulting	Electronic Data Systems Corp.	Andersen Consulting	Computer Sciences Corp.
25	Computer Sciences Corp.	SHL Systemhouse, Inc.	Computer Sciences Corp.	Andersen Consulting

Source: *Computerworld* and ParaTechnology, Inc.
*American Management Systems, Inc.

continued from page SI/17

recent complete fiscal year. Services exclude hardware and software resold by the integrator, as well as canned software developed by the integrator for sale.

In addition to revenue, *Computerworld* required that the 25 integrators have a significant presence in the marketplace. Presence was determined by a telephone survey of more than 15,000 randomly selected information systems managers, including *Computerworld* subscribers. Conducted in July and August 1995, the survey asked IS managers to name the systems integrators they have used in the past three years. The vast majority of the 15,000 names used in this survey came from independent sources not affiliated with systems integrators.

Once the list of 25 integrators was established, ParaTechnology surveyed 1,024 of their customers. High-level technology managers with specific knowledge of the integration projects were interviewed, including chief information officers, directors of technology and IS managers. At least 35 customer surveys were completed for each integrator. For most, 50 surveys were completed. The 1,024 people surveyed were drawn from the aforementioned list of 15,000 IS managers.

Customers were asked to rate their satisfaction with their systems integrators in 22 critical areas, including project completion (on time and on budget), system compatibility and ease of use, and knowledge transfer. The systems integrators were ranked on the mean of their ratings for each category. (The top 10 integrators for all 22 areas are listed on this page.)

Satisfaction was ranked from 1 to 5, with 5 being "very satisfied" and 1 being "very dissatisfied." Mean scores for all systems integrators in all categories averaged above 3 (neutral), and the majority scored below 4 (satisfied). •

For more information on the methodology, contact Bob Fink, *Computerworld* research director, or Peter Raulerson, president and CEO, ParaTechnology, Inc. Fink can be reached on the Internet at bob_fink@cw.com or by telephone at (508) 820-8116. Raulerson can be reached via the Internet at 71441.121@compuserve.com or by telephone at (800) 377-2021.

COMPANY SIZE BY REVENUE

MORE THAN $10B	13%
$1B TO $10B	26%
$500M TO $1B	10%
$100M TO $500M	16%
LESS THAN $100M	25%
NO RESPONSE	10%

NUMBER OF COMPANY EMPLOYEES AFFECTED BY THE INTEGRATION PROJECT

LESS THAN 25	9%
25 TO 49	7%
50 TO 100	11%
100 TO 249	17%
250 TO 499	10%
500 TO 1,000	14%
1,000 TO 2,499	15%
2,500 TO 4,999	7%
5,000 TO 50,000	10%
MORE THAN 50,000	1%

PROJECT MANAGEMENT CRITERIA BREAKOUTS

	Training provided by integrator to users	Integrator's ongoing service/support	Integrator's quality assurance
1	Deloitte	HP	Future Now
2	AmeriData	AmeriData	Unisys
3	Price Waterhouse	Control Data	AmeriData
4	Control Data	Vanstar	HP
5	HP	Price Waterhouse	IBM
6	Unisys	Entex	Control Data
7	Future Now	Digital	Digital
8	USConnect	IBM	Price Waterhouse
9	Entex	Unisys	Cap Gemini
10	Shared Medical	MicroAge	Deloitte

	Integrator's knowledge of your business	Integrator's systems integration experience	Integrator's level of flexibility
1	Deloitte	USConnect	AmeriData
2	Ernst & Young	Unisys	Control Data
3	Shared Medical	HP	MicroAge
4	Unisys	Cap Gemini	Price Waterhouse
5	AMS	MicroAge	Entex
6	Price Waterhouse	IBM	HP
7	AmeriData	Digital	Future Now
8	KPMG	Shared Medical	Cap Gemini
9	Coopers	Future Now	Digital
10	HP	AmeriData	Deloitte

	Integrator's project management skills	Project's final price vs. bid price	Project's final price relative to performance
1	Coopers	AmeriData	USConnect
2	Deloitte	MicroAge	Unisys
3	Price Waterhouse	Unisys	AmeriData
4	Andersen	USConnect	Control Data
5	Ernst & Young	Entex	Future Now
6	IBM	Digital	MicroAge
7	HP	Inacom	Inacom
8	Unisys	Coopers	HP
9	Control Data	HP	Vanstar
10	SHL	Vanstar	Entex

BUSINESS PRACTICES CRITERIA BREAKOUTS

	Ease of doing business with integrator	Personal relationship with integrator	Integrator's problem resolution process
1	AmeriData	Unisys	AMS
2	MicroAge	AmeriData	AmeriData
3	Entex	Control Data	Control Data
4	Price Waterhouse	Price Waterhouse	KPMG
5	Control Data	Entex	Price Waterhouse
6	Deloitte	Digital	Deloitte
7	HP	Future Now	IBM
8	Unisys	Shared Medical	HP
9	Digital	MicroAge	Unisys
10	Cap Gemini	AT&T	Future Now

	Integrator's communication process	Transfer of knowledge to your organization	Integrator's innovativeness
1	Price Waterhouse	Digital	Unisys
2	Control Data	Unisys	HP
3	AmeriData	USConnect	Control Data
4	Deloitte	Control Data	Deloitte
5	Unisys	HP	Price Waterhouse
6	AMS	AmeriData	USConnect
7	KPMG	Entex	AmeriData
8	HP	Shared Medical	Future Now
9	Coopers	MicroAge	AT&T
10	Cap Gemini	Cap Gemini	Digital

TECHNICAL PERFORMANCE CRITERIA BREAKOUTS

	Project's technical features	Project's business benefits	Actual vs. scheduled completion time	Compatibility with other systems	System's ease of use	Overall quality of integrator's project	Integrator's technical expertise
1	HP	HP	AmeriData	USConnect	AmeriData	AmeriData	IBM
2	Unisys	Unisys	Price Waterhouse	AmeriData	USConnect	HP	HP
3	AmeriData	USConnect	Unisys	Entex	Future Now	Unisys	Unisys
4	USConnect	AMS	Coopers	Unisys	HP	Price Waterhouse	Control Data
5	Future Now	AT&T	Inacom	Cap Gemini	Inacom	AT&T	Future Now
6	IBM	Deloitte	USConnect	Future Now	Unisys	Entex	USConnect
7	MicroAge	Future Now	Digital	MicroAge	Entex	Future Now	Digital
8	AT&T	MicroAge	Entex	Vanstar	Digital	Digital	Deloitte
9	Electronic Data	Ernst & Young	HP	IBM	MicroAge	USConnect	AT&T
10	KPMG	KPMG	Future Now	HP	Deloitte	MicroAge	Cap Gemini

Source: *Computerworld* and ParaTechnology, Inc.

Computerworld's Top 25 Integrators by Revenue

Ranked by North American integration services revenue	Company	Headquarters	Type of integrator (top-down, bottom-up or both)[1]	North American integration revenue (services only unless noted)	North American integration revenue as % of total revenue (services only unless noted)	Commercial integration revenue as % of total integration revenue	International integration revenue as % of total integration revenue	Number of integration offices worldwide	Total integration employees worldwide	Vertical markets served[2]	World Wide Web sites
1	Electronic Data Systems Corp.	Plano, Texas	BT	$7,370,000,000 [3]	73%[3]	85%	25%	450	NA	C,E,G,I,J,K,L,M,P,R,S,U,V,W,X	http://www.eds.com
2	IBM Corp.	White Plains, N.Y.	BT	$6,000,000,000	9%	92%	38%	390	15,000	C,D,E,G,J,K,L,M,N,P,R,T,U,W,X	http://www.ibm.com
3	Computer Sciences Corp.	El Segundo, Calif.	T	$2,272,000,000	88%	52%	12%	575	NA	C,J,K,L,M,P,R,T,W,X	http://www.csc.com
4	Andersen Consulting	Chicago, Ill.	T	$1,678,000,000 [3]	49%[3]	90%	46%	152	32,711	C,F,I,K,L,M,P,T,W,X	http://www.ac.com
5	AT&T Corp.	Dayton, Ohio	BT	$1,050,000,000	1%	70%	25%	1,100	47,000	C,F,K,M,T,U,X	http://www.att.com
6	Digital Equipment Corp.	Maynard, Mass.	BT	$1,000,000,000	7%	80%	55%	800	31,000	C,D,E,G,J,K,L,M,P,R,T,U,W,X	http://www.digital.com
7	Hewlett-Packard Co.	Mountain View, Calif.	BT	$903,000,000	4%	85%	50%	600	5,000	C,E,G,J,K,L,M,P,R,T,W,X	http://www.hp.com
8	Shared Medical Systems Corp.	Malvern, Pa.	T	$434,700,000	79%	100%	12%	36	4,000	L	NA
9	Ernst & Young	New York, N.Y.	T	$410,000,000	26%	100%	40%	600	6,300	A,C,D,E,F,I,J,L,M,P,Q,R,T,U,W,X	http://www.ey.com
10	American Management Systems, Inc.	Fairfax, Va.	T	$374,094,000	81%	57%	18%	41	4,195	C,G,I,K,L,M,R,T,W	http://www.amsinc.com
11	Price Waterhouse	Bethesda, Md.	T	$357,000,000	9%	80%	65%	150	15,000	C,E,H,J,K,M,N,P,R,T,W,X	http://www.pw.com
12	Unisys Corp.	Blue Bell, Pa.	BT	$302,400,000	5%	78%	68%	155	NA	A,C,K,L,M,U	http://www.unisys.com
13	SHL Systemhouse, Inc.[5]	Toronto, Ontario	T	$264,000,000	23%	70%	15%	90	4,500	C,D,E,G,I,K,L,M,N,O,P,R,T,W,X	http://www.shl.com
14	KPMG Peat Marwick	Montvale, N.J.	T	$249,300,000	4%	65%	55%	1,100	NA	A,B,C,D,E,G,J,K,L,M,N,P,R,T,U,W,X	http://www.kpmg.com
15	Deloitte & Touche	Wilton, Conn.	T	$233,000,000	4%	60%	40%	130	3,100	C,E,K,L,M,P,R,T,X	http://www.dttus.com
16	Cap Gemini America, Inc.	New York, N.Y.	T	$197,000,000 [3]	100%[3]	NA	NA	35	2,500	A,C,E,F,K,P,R,T,W,X	NA
17	Vanstar Corp.	Pleasanton, Calif.	B	$193,641,089	15%	90%	0%	95	1,641	Fortune 2000 companies	http://www.vanstar.com
18	Inacom Corp.	Omaha, Neb.	B	$179,550,000	10%	94%	0%	1,400[7]	850	All	http://www.inacom.com
19	Entex Information Services	Rye Brook, N.Y.	B	$162,500,000	13%	85%	0%	300	1,900	C,E,K,L,M,N,R,T,W	http://www.entex.com
20	Coopers & Lybrand	New York, N.Y.	T	$148,000,000	8%	99%	49%	100	2,400	B,C,D,G,I,K,L,M,P,R,T,W,X	http://www.colybrand.com
21	MicroAge, Inc.	Tempe, Ariz.	B	$132,969,293 [4]	6%	81%	1%	75	768	Fortune 1000 companies	http://www.mid.com
22	USConnect, Inc.	Stamford, Conn.	B	$80,676,000	37%	95%	17%	50	1,350	C,D,G,K,L,M,N,P,T,X	http://www.usconnect.com
23	Control Data Systems, Inc.	Arden Hills, Minn.	T	$70,697,860	13%	60%	60%	52	2,100	C,K,P,T	http://www.cdc.com
24	AmeriData Technologies, Inc.	Minneapolis, Minn.	B	$69,500,000	7%	80%	0%[6]	70[6]	882[6]	C,D,G,K,L,M,N,P,T,U,W,X	http://www.ameridata.com
25	The Future Now, Inc.	Cincinnati, Ohio	B	$67,000,000 [4]	8%	98%	0%	26	629	D,G,K,P	http://www.tfn-in.com

Twenty-five of the largest systems integrators, based on fiscal 1994 data.
Source: ParaTechnology, Inc.

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[1] T = Top-down integrators typically focus on consulting and applications; the project is driven from the boardroom.
B = Bottom-up integrators typically focus on implementation; the project is driven by the need for new or upgraded technology.
BT = Integrators with both top-down and bottom-up practices.

[2] **Vertical Markets Key** A. Aeronautics/aerospace B. Automotive C. Banking/financial D. Business service E. Chemical F. Consumer products G. Education H. Electronics I. Energy J. Entertainment K. Government L. Health care M. Insurance N. Legal O. Logistics P. Manufacturing Q. Media R. Pharmaceutical S. Publishing T. Telecommunications U. Transportation V. Travel W. Utilities X. Wholesale/retail

[3] Estimate does not factor out hardware and software components of integration revenue.

[4] Estimate by company.

[5] Acquired by MCI Communications Corp. in September 1995.

[6] Figure does not include AmeriData Technologies' 1995 purchase of $34 million worth of international product integration and maintenance operations from Control Data Systems, which resulted in 1,000 CDS employees transferring to AmeriData.

[7] Offices include Inacom franchises.

NA = Not available.

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